

unprecedented rapidity. These fires continued to burn for about 10 days, when expert fire fighters were carried by aeroplane to strategic positions around the conflagrations. Cooler weather, accompanied by high relative humidity, aided the fighters in checking the fires. During six weeks the Forest Service expended \$80,000 in combating forest fires in the national forests of California, most of them in the extreme northern portion of the State. If only 2 per cent of trees struck by lightning are ignited, as is stated in Forest Service Bulletin No. 111, there must have been a tremendous amount of electrical activity in the atmosphere over northern California during the summer of 1920.—A. H. Palmer.

A HOT SQUALL ON THE MAINE COAST.¹

August 15, 1920, there was an unusual hot squall between 6 and 7 p. m. on the Maine coast at Ogunquit, York County, about 24 miles south of Portland, Me.

The weather had been peculiar for a week. On the coast there was a light east wind with cool air and much dense fog, while inland it was very hot and humid. Within observation from the beach great cumulo-nimbus clouds were observed every afternoon and heavy thunder was heard and lightning seen, but these disturbances on nearing the ocean were completely smothered by the cooler air. There was no rain on the ocean rim, but very heavy downpours fell inland only 20 miles, with severe

lightning. And these disturbances invariably followed the rivers. The fishermen maintain that thunderstorms can not occur on the beach except at ebb tide, and this rule was not broken [nor verified]. For days the same localities got a drenching, while spots only a few miles away had not had a bit of rain for a month.

On August 15, at 6 p. m., the air on the beach was quite cool, about 62° F., with a light east wind. A heavy thunderstorm was visible about 20 miles north moving southeast. A black bank of clouds was observed coming from the north-northeast, and it rapidly approached, giving a blue-black sky. The clouds were mammato strato-cumulus, and on reaching the observer a moderately strong squall broke. The wind came from the northeast, from over the cold ocean, yet the temperature rose to 73° and it felt distinctly hot and very dry. The temperature remained at 73° for nearly an hour. The thunderstorm proper made off to sea in a southeasterly direction at some distance with a fine display of lightning. No rain fell on the beach, nor did the lightning get any nearer. Two days later, when a northeast wind of the same velocity was blowing, the temperature registered 58°. It seems as if this hot squall must have been a down-draft, differing from the usual cool squall possibly through having insufficient evaporating rain to keep the descending air cool.² The same kind of a squall in a milder form took place the next evening about the same time.—R. M. Dole.

¹ Cf. MONTHLY WEATHER REVIEW, Aug. 1919, 47: 566-567.

² See *ibid.*, July, 1914, 42: 364; or *Jour. Franklin Inst.*, July, 1918, 186: 63-64 (W. J. Humphreys).

NOTES ON CLOUD PHOTOGRAPHY.¹

By WILLIAM S. DAVIS.

[Orient, N. Y., May 25, 1920.]

The accompanying cloud studies were made at Orient, a village located upon the small peninsula forming the east end of the north fork of Long Island, N. Y. Because of the small land area in comparison with that of the surrounding waters of Long Island Sound, Gardiners Bay, and Orient Harbor, the air currents at low elevations are less affected by local conditions upon the ground than would be the case in most sections, especially those removed from the coast.

In regard to the best method of photographing clouds, my experience leads me to advise the use of color-sensitive emulsions at all times, and in combination with a suitable ray filter when color is an important factor. If plates, rather than films, are employed the double-coated "nonhalation" variety will permit more latitude in exposure than the single-coated kind, though either can be used successfully if proper care is exercised to avoid overexposure upon delicate cloud forms.

When exposing on gray clouds there is little if anything to be gained by placing a ray filter on the lens, unless one is aiming to secure a good rendering of landscape at the same time. In this case, a filter generally helps to equalize tonal differences between sky and foreground sufficiently to allow of timing the exposure for the latter without loss of quality in the sky.

White clouds against a blue sky always call for the use of a ray filter to secure the best possible results, as is also the case when dealing with a brilliant sunset to better preserve the relative visual luminosity of the differ-

ent colors. For general use a ray filter of moderate depth of yellow will be found sufficient, representative ones of this class being the Ingento series A, Cramer Isos II, and Wratten K1. To secure for study purposes the clearest rendering of very thin filmy clouds, such as certain types of cirrus, however, it is advisable to employ considerably stronger colored filters to emphasize the slight contrast between the clouds and sky. The same applies in the matter of preserving the luminous effect of deep yellow and orange tints in a gorgeous sunset sky. Here is where such a filter as the Ingento B (or the C series for still more contrast), Wratten K2 series, or Isos III will prove helpful.

When timing exposures for clouds alone, without regard to any land shown below, one-fourth the time usually allowed an open landscape will be found approximately correct for well-defined cloud masses, but very delicate white clouds would need still less comparative exposure, followed by longer time of development than usual in a solution well restrained with potassium bromide.

As a rough guide for a beginner, it may be stated that when using plates similar in speed to the Cramer "Inst. Iso" an exposure of one-fiftieth second without a ray filter would be close to the mark for bold masses of gray cloud in summer light, with the lens stopped to F. 16. Using the same sized stop, and a light yellow ray filter over the lens, from one-fifth to one-tenth second could be given upon white clouds in good sunlight, though a longer time could be allowed without harm when the tonal contrasts are well defined. All these exposures should be increased in early morning or near sunset, and in the weaker actinic light during the winter season.

¹ See also A. J. Henry: Cloud photography. MONTHLY WEATHER REVIEW, May, 1895, 23:169-171, 255. In this article the use of a liquid filter is described. See also for a cut of the apparatus as used *Scientific American* 72:137, March 2, 1895. The use of orthochromatic photographic plates, a developer strong in the reducing agent and highly restrained is recommended.